zine are being carried on. The change has come about through the absorption of the British Rainfall Organization in the Meteorological Office. The cover of the new publication gives the portraits of four pioneers of meteorology, all of whom were associated with the Meteorological Office. Of these Admiral FitzRoy had charge of the Office at its initiation, when it was a branch of the Board of Trade, and Mr. Symons was an assistant 60 years ago, but left after a short period and devoted himself to the collection of rainfall returns, from which evolved later the British Rainfall Organization. Gens. Sabine and Strachey were, successively, chairmen of the Meteorological Office when controlled by the Royal Society. Little change has been introduced into the style and character of the publication, and it is evidently not intended to make any radical alteration. In addition to the interesting article on "Weather in the British Isles" for the preceding month, which has hitherto regularly appeared in Symons's Meteorological Magazine, an article is now given on "Weather Abroad" which will doubtless be valued by readers of the journal.

DIFFUSION OF LIGHT BY RAIN, CLOUD, OR FOG.

By A. MALLOCK.

[Abstracted from Proceedings of the Royal Society, ser. A, vol. 96, pp. 267-272.]

This paper considers the diffusion of light by particles whose linear dimensions are large relative to the wave length of light. If a source of light is placed within an indefinitely extended cloud which is composed of perfectly transparent small spheres, there is a certain distance beyond which none of the direct rays from the source is received. In this case each drop acts as a separate source of light and diffuses such light as it receives uniformly in all directions. The author defines his "proof plane" as the brightness of a perfectly white plane surface which could be substituted, at the same distance, for the plane in which the perfectly transparent spherical drops are located; for, "since the total quantity of light passing through every spherical surface about the source is constant, it is clear that the illumination will vary inversely as the square of the distance from the source."

It is pointed out that the difficulty of seeing things through a stratum of cloud is not due to loss of definition, but to diffusion and the consequent lack of contrasts between light and shade. This is shown by the perfect definition of the sun through a layer of cloud which really cuts down the light to a great degree by diffusion.

A table is prepared showing the effect of a shower or cloud layer in diffusing the light from a distant source. The following terms were tabulated:

c, the diameter of the drop.

n, the number of drops in a volume a^3 required to diminish by one-half the directly transmitted light.

l, the length of a column of the cloud of section a^2 which contains n drops.

N, the number of drops per unit volume of the clouds.

D, the average distance between drops.

This table was calculated on the basis of the water content in volume a^3 of the cloud being 1/100,000, which at first was thought to be a reasonable estimate. From the results of the table and certain studies in the rate of rainfall, it is believed that this value has been overestimated and that, in the case of falling rain, the volume of water can not form anything like 1/100,000 of the total volume.

TABLE 1.

c.	n.	l.	N.	D.
Inches.		*Inches.*		*Inches.*
0.1	100	10,000	0.01	4.6
.08	164	8,000	.0204	3.65
.06	285	6,000	.0475	2.71
.05	400	5,000	.080	2.32
.04	625	4,000	.156	1.82
.02	3,500	2,000	1.25	1.045
.01	10,000	1,000	10	.483
.008	16,400	800	20.5	.365
.006	28,500	600	47.5	.275
.005	40,000	500	80	.232
.004	62,500	400	366	.140
.002	250,000	200	1,250	.092
.001	1,000,000	100	10,000	.022

"The case is rather different for fog and mist * * *, but even when a fog is so dense as to make a street lamp only just visible at a distance of 10 feet (the densest white fog in my experience) it will be found that either the drops must have been much less than a thousandth of an inch in diameter or that Q [the volume of water content] much less than 10^{-5}." The "proof plane" referred to above was used in calculating l in the table.—*C. L. M.*

Discussion.—It may be of interest in connection with the above abstract to give the size of the drop to be found in various kinds of precipitation. Further data on this question was published in the MONTHLY WEATHER REVIEW, October 1, 1919, page 722. Adopting the same general classification of type of precipitation as is presented in that note, the diameters of the drops average about as follows: Fog, 0.01 mm.; mist, 0.1 mm.; drizzle, 0.2 mm.; light rain, 0.45 mm.; moderate rain, 1.0 mm.; heavy rain, 1.5 mm.; excessive rain, 2.1 mm.; cloudburst, 3.0 mm. to 5.0 mm. These values show the correctness of the author's conclusion in spite of the fact that he was not familiar with these computations.—*W. J. Humphreys.*

LIGHT SCATTERING BY AIR AND THE BLUE COLOR OF THE SKY.

By R. W. WOOD, Professor of Experimental Physics, Johns Hopkins University.

[Author's summary.] [1]

1. The intensity of the light scattered by a given thickness of dust-free air in a tube illuminated by concentrated sunlight has been compared photometrically with the light of the sky by reducing the intensity of the latter until a match was secured. The ratio of the two intensities was compared with the calculated ratio, making certain assumptions in the case of the light of the sky and a fair agreement found.

2. The intensity of the light scattered by dust-free air nearly in the direction of the incident light has been examined and found to be not very different from the intensity scattered in a perpendicular direction. It is theoretically twice as bright, but the conditions of the experiment did not permit of the determination of a difference of this amount. This indicates that the enormous increase in the intensity of the sky close to the sun's limb (over twentyfold) results from diffraction by motes in the air, and would be wholly absent if the atmosphere were perfectly clean.

3. The scattering power of the air near the ground on the clearest days in the country has been found to be about 2.6 times the average scattering power of the atmosphere.

[1] Reprinted from the London, Edinburgh, and Dublin Phil. Mag., London, April, 1920, sixth series, vol. 39, No. 232, p. 433.